

Ochsner (A. J.)

al

PRACTICAL IDEAS ON ANTISEPTIC AND ASEPTIC  
METHODS IN THE TREATMENT OF WOUNDS.  
WITH A REPORT OF FORTY-SEVEN CON-  
SECUTIVE OPERATIONS FOR NON-SUP-  
PURATIVE CONDITIONS, IN THE  
AUGUSTANA HOSPITAL DURING  
THE PAST YEAR.

BY

DR. A. J. OCHSNER, B.S., F.R.M.S.

SURGEON-IN-CHIEF OF AUGUSTANA HOSPITAL; CONSULTING SURGEON OF HOSPITAL FOR WOMEN AND  
CHILDREN, CHICAGO, ETC.

LIBRARY  
SURGEON GENERAL'S OFFICE

JUN.-23.-1899

632

presented by the author

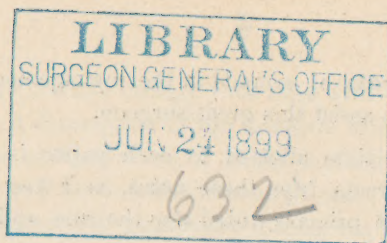
*Read before the Chicago Medical Society, May 16th, 1892.*

*Reprinted from THE CHICAGO MEDICAL RECORDER, June, 1892.*

Press of  
R. R. McCabe & Co.  
144 Monroe Street, Chicago







## PRACTICAL IDEAS ON ANTISEPTIC AND ASEPTIC METHODS IN THE TREATMENT OF WOUNDS.

WITH A REPORT OF FORTY-SEVEN CONSECUTIVE OPERATIONS FOR NON-  
SUPPURATIVE CONDITIONS, IN THE AUGUSTANA HOSPITAL  
DURING THE PAST YEAR.

By DR. A. J. OCHSNER, B.S., F.R.M.S.

SURGEON-IN-CHIEF OF AUGUSTANA HOSPITAL; CONSULTING SURGEON OF HOSPITAL FOR WOMEN AND  
CHILDREN, CHICAGO, ETC.

Antiseptic and aseptic surgery have been discussed so frequently and by so many men who are great in their profession, that I cannot venture to speak upon these subjects before this Society without giving the reasons which justify my action.

My observations, upon which the following methods are based, have extended over a period of more than seven years.

At the beginning of this time my interest in this subject was aroused by the most conscientious and enthusiastic work Prof. Chr. Fenger was doing in this direction in the Cook County Hospital. The following year, while Interne in the Presbyterian Hospital, Prof. Moses Gunn kindly permitted me to apply my ideas in all of his operations and dressings, with the remarkable result of only two instances of suppuration in cases of wounds for non-suppurative conditions throughout my entire service under this brilliant surgeon.

While studying in Europe during the following two years I carefully observed the methods employed, particularly in the clinics of Profs. Billroth, Albert and Braun in Vienna, Krönlein in Zürich, v. Bergmann, Hahn, Bardeleben, Olshausen and Martin in Berlin, and Schede in Hamburg.

Upon returning to Chicago, Prof. Chas. T. Parkes, with whom I had visited the above and other clinics in Europe, kindly gave me the management of antiseptic methods in connection with all of his operations and dressings in his clinical and hospital as well as in his private practice. I have preserved accurate notes concerning the progress of

each one of the hundreds of wounds in the management of which I had the good fortune to assist this great surgeon.

Unfortunately, the time allotted to each paper is too short to permit the use of abstracts from these notes, as I had intended. I will, however, state that primary union was the rule and suppuration the rare exception.

For the past year I have had the privilege of assisting Prof. N. Senn in the care of all of his cases during and after his operations in the Surgical Clinic at Rush Medical College and at the Presbyterian Hospital, thus adding many valuable observations in this most important subject.

Such favorable opportunities for studying methods and results would, I think, justify me in describing the methods which I have chosen, not only from the study of theory, but from their value in practice, and which I apply in my surgical work, notwithstanding the fact that there is nothing new in these methods.

Antiseptic surgery has experienced three distinct epochs, the first consisting in the discovery of the principle by Sir Joseph Lister, and the time following, during which various antiseptic substances were employed empirically; the second beginning with the accurate scientific observations introduced by Prof. R. Koch, determining the power of various antiseptic substances when applied in culture media, demonstrating the strength of solutions necessary to retard or obstruct the growth of the different bacteria; and the third epoch comprising the present time when antiseptic methods are used by most operators only to the extent of securing aseptic conditions.

This plan has been advocated for some time by many of those most experienced in the practice of surgery, but it was almost as difficult to change from antiseptic to aseptic methods as it had been to change from septic to antiseptic methods.

The studies of Geppert, which showed that all previous observations with the most powerful one of the antiseptic substances,—corrosive sublimate—had contained a fatal error, impressed observers more thoroughly with the idea that studies made in the test-tube cannot safely be applied to surgical operations, and this has had much to do with bringing about the present tendency toward aseptic surgery.

It would be useless to attempt a review of all of the important papers which have appeared since 1867, dealing directly with this subject. My own reading has covered more than one hundred of these, and I know of nearly twice as many others which I have not had an opportunity to read.



I will therefore not occupy your time with these reviews, but will limit myself to a description of the methods which I follow in my own practice, and as an illustration of these methods and their results, I have tabulated abstracts of histories of all cases operated upon by myself for non-suppurative conditions during the past twelve months in the Augustana Hospital of this city, in which I have had the entire control of the surgical work. I do not include orthopædic operations in which no wounds were produced, or in which the wounds were made subcutaneously, nor cases which were treated by hypodermic injections. Neither do I include operations in the mouth, in the nasal cavity, in the vagina, or bladder, or rectum, because it has been repeatedly proven that there is neither a possibility nor a necessity for destroying all of the micro-organisms in these locations previous to operations. In order to give a clearer idea of the plan followed I will describe the different steps taken:

**PREPARATION OF HANDS.** My own hands and those of my assistant and the nurse who handles the sponges are washed thoroughly with ordinary good white soap in warm, running water, with a scrubbing brush. The finger-nails are cleaned with a pen-knife, and then the hands are washed once more in the same manner. They are then dried on a clean towel and then washed with one-half to one ounce of strong alcohol.

*After the hands are washed in this manner, they never touch anything except the instruments or ligatures, the sponges or the wound, and to this simple fact I attribute the complete absence of suppuration or sepsis in a large number of successive cases.*

My observations have taught me that it is a very simple matter to get everything surgically clean before an operation, but an exceedingly difficult matter to prevent the operator or his assistants, or the nurse, from handling something during the operation which directly or indirectly brings septic matter in contact with the wound.

As a rule my own hands alone come in contact with the wound, in order to fix the responsibility. The assistant aids by means of retractors or other instruments. A basin of warm water is placed on a stand conveniently near for washing my hands. This water is changed frequently by a nurse who does not handle anything which is used directly in the operation.

In order to eliminate a frequent cause of infection, I never touch a suppurating wound, or a soiled dressing, or pus from any source, if I can possibly avoid it, either in operations or in dressing wounds; and when there are several operations on the same day, I always

arrange them so as to do those for non-suppurative conditions first. It is a rule with me, never to dress any case immediately before operating. I have often observed, that if a surgeon is in the habit of constantly getting his fingers into pus, his assistants are sure to imitate him in this particular, but they are slow to learn the necessity of following this bad practice by a thorough process of disinfection.

**CARE OF INSTRUMENTS.** The instruments are placed in a clean platter, either dry or in hot water, or hot two per cent. carbolic acid solution, simply to keep them clean, not with any idea of disinfection. During the operation they are never placed upon anything which is not covered with a clean towel.

After the operation the instruments are washed carefully in several changes of soap and hot water. They are always dried out of water at or near the boiling point in order to thoroughly dry the joints. They are then preserved in clean canvas cases.

If the instruments have come in contact with pus they are boiled in a closed vessel for twenty minutes in water, with the addition of a tablespoonful of baking soda to the quart of water, the soda preventing the formation of rust.

An instrument which has become rusty is at once replated. This incurs but a slight expense, and it is easier to see dirt on a plated than on a rusty instrument.

**SPONGES.** The sponges used consist of absorbent cotton rolled between the hands into convenient bunches, wrung out of boiled water immediately before the operation. These sponges are always applied dry, there being simply enough moisture to prevent the adhesion of cotton fibres to the wound.

In abdominal sections we use sea-sponges which have been thoroughly cleaned by repeated washings in pure warm water and then preserved in five per cent. solution of carbolic acid. If any of these sponges come in contact with pus they are permanently discarded.

**SUTURES.** Both silk and cat-gut sutures are employed; the former are boiled in water for an hour and then preserved in a five per cent. watery solution of carbolic acid.

The cat-gut is de-fatted for several days in ether, then placed in five per cent. carbolic acid in water for forty-eight hours and preserved in 1-1000 corrosive sublimate in strong alcohol.

Cat-gut sutures and ligatures are kept in strong alcohol during the operation to prevent them from swelling. Silk sutures are immersed in boiled water.



PREPARATION OF THE OPERATING ROOM. Owing to a lack of space in the present building I operate in any one of the twelve rooms and wards of the hospital, not considering it necessary to remove the furniture, nor especially to cleanse floors and walls.

An operating table is placed near a window, a small table to one side for the instruments, ligatures and sutures, another one upon the other side for the sponges. All are covered with freshly laundered sheets or towels. The patient is placed upon the table, preferably before the administration of the anæsthetic. *Everything is in readiness, and from this time until the wound is dressed nothing is disturbed in the room, and any instrument, sponge or suture which has touched anything not protected by clean towels is discarded for the entire operation.*

The patient receives a full bath with soap and water and a cathartic the day before the operation; he is also limited to a light diet during this day. This practically disposes of causes of infection from the skin and the alimentary canal. The patient receives no breakfast on the morning of the operation, which takes place at 8 A. M. in this hospital.

Immediately before the operation the surface is washed thoroughly with soap and warm water, then shaved, then washed again with water, and then with strong alcohol.

This disposes of the dirt, the loose epidermis, the hair and the fat, and leaves the skin clean and dry, and not irritated. A piece of gauze saturated with strong alcohol is left in contact with the surface for a minute or two before an incision is made. The field of operation is surrounded by dry, freshly-laundered towels. *The operation is always performed with the greatest amount of speed compatible with the greatest care.* The tissues are manipulated gently, in order to prevent tearing, crushing, or bruising. The wound is held open with retractors for the same reason. Hemorrhage is controlled thoroughly, by means of catgut ligatures or by pressure.

In suturing, care is taken to bring the surfaces accurately together in order to avoid spaces and raw surfaces. Whenever a considerable amount of wound secretion is anticipated, the wound is either packed with iodoform gauze, or a rubber drainage tube is applied. This, however, is seldom necessary because wounds treated in this way rarely secrete much.

Three or four days after the operation the packing or the drainage tube is removed, and the surfaces are held in contact by the application of pads of gauze or cotton.

The dressing consists of ten per cent. of iodoform gauze, carbolated gauze, and absorbent cotton held in place by roller bandages. In wounds in which no drainage is expected, strips of iodoform gauze are applied and held in position by flexible collodion painted along their edges. No irrigation is employed, except in the presence of pus, and no antiseptic substance is applied to the wound.

When aseptic wounds are redressed, either for the purpose of removing drainage-tubes or sutures, or for the purpose of removing iodoform gauze packing and tying secondary sutures, the surface is simply sponged off with strong alcohol, and no irrigation is employed. I have seen many aseptic wounds infected by irrigation and other unnecessary manipulations at the first dressing. The dressing used is ordinarily the same as the original dressing. If there is any redness, or a slight amount of infection, a moist dressing of a sat. sol. of acetate of aluminium or a three per cent. carbolic acid dressing will usually relieve the condition at once.

The following are the histories mentioned:



Name and residence.	Age.	Diagnosis.	Duration of disease.	Treatment.	Result.	Date of admission.	Date of discharge.
Matilda C., Attica, Ind.	45	Epithelioma upper eyelid.	6 mos.	Removal of half the eyelid; advised a secondary plastic operation after six months.	Progress aseptic throughout.	Oct. 30, 1891.	Nov. 20, 1891.
Mrs. M., Chicago.	65	Epithelioma lower lid of right eye.	6 years.	V shaped excision with three-quarter inch base; closure of wound with silk sutures.	Primary union.	July 8, 1891.	July 13, 1891.
Chas. P., Ironton, Wis.	56	Seventeen years ago patient had face badly crushed in a runaway, leaving a fistula in right eyelid and the eye destroyed. Several attempts at closing fistula had failed.	17 yrs.	Evisceration of eye to form stump for artificial eye and closure of fistula by splitting the tissues and uniting with three rows of sutures.	Primary union; no pus.	April 15, 1891.	May 2, 1891.
Oscar O., Chicago.	8	Suppurating dermoid cyst of left lower eyelid.	2 years.	Excision of entire cyst; closure of wound with silk sutures.	Primary union.	Jan. 22, 1892.	Feb. 5, 1892.
Bessie M. R., Waukesha, Wis.	11	Congenital double nose. Patient also has second toes double.	11 yrs.	Longitudinal incision through nose, splitting cartilage and removal of wedge-shaped portion. Deep quilled sutures, silk sutures for skin.	Deformity corrected; primary union.	June 29, 1891.	July 14, 1891.
John G., Kimball, S. Dak.	11	Cicatricial contraction of face, causing ectropion and carrying the lower lip beneath the chin. Four years ago patient was burned in a prairie fire.	4 years.	Semilunar incision beneath each eyelid. Implantation of skin grafts $\frac{3}{4} \times 1\frac{1}{2}$ inch. Semilunar incision beneath the chin, dissection of cicatricial tissue. Covering of raw surface with Thiersch's skin grafts 4x6 inches.	Healing throughout: patient closes mouth and eyes normally.	Jan. 27, 1892.	April 27, 1892.
Christ M., Rockford, Ill.	26	Varicocoele, severe pain and nervous symptoms.	2 years.	Excision of enlarged veins.	Primary union.	July 15, 1891.	Aug. 1, 1891.

Name and residence.	Age.	Diagnosis.	Duration of disease.	Treatment.	Result.	Date of admission.	Date of discharge.
E. A. G., Curry, Wis.	24	Varicocele; symptoms as above.	8 years.	Excision of enlarged veins.	Primary union.	June 24, 1891.	July 4, 1891.
James W., St. Louis, Mo.	36	Varicocele; caused by heavy lifting.	8 years.	Excision of enlarged veins. Some irritation occurred on fourth day which subsided upon application of sat. sol. of boric acid at once.	Primary union; no rise of temperature.	June 29, 1891.	July 7, 1891.
C. E. B., Iron Mountain, Mich.	32	Hydrocele of right side; caused by traumatism sixteen years ago. Was tapped and injected seven years ago.	16 yrs.	Incision; attachment of tunica vag. to skin. The sac was found to be covered with small tubercles. Cauterization with strong carbolic acid. Packing with iodoform gauze. This was removed on fifth day and repacked.	Healing from the bottom by granulation. Wound became infected two weeks after operation.	Jan. 18, 1892.	Feb. 24, 1892.
Mrs. C. A. A., Galesburg, Ill.	35	Lipoma of neck as large as a child's hand.	2 years.	Enucleation; closure of wound with catgut.	One dressing; primary union.	April 25, 1891.	May 3, 1891.
Emma J., Chicago.	25	Lipoma of labium maj. as large as two fists.	30 mos.	Enucleation; closure of wound throughout with cat-gut sutures.	Primary union; one dressing.	Aug. 10, 1891.	Aug. 19, 1891.
Charlotte E., Geneseo, Ill.	40	Angiolipoma as large as a hand over seventh rib in lumbar region.	1 year.	Removal; closed with deep and superficial silk sutures.	Primary union; one dressing.	May 31, 1891.	Sept. 12, 1891.
Molly L., Laporte, Ind.	10	Congenital lipomata of right axilla and left side, each as large as a hand.	10 yrs.	Removal; applied iodoform gauze packing to overcome oozing, permitting it to project through an opening in the skin. Closed wound throughout; removed packing third day and applied pad to coapt surfaces.	Primary union; two dressings.	Nov. 16, 1891.	Dec. 2, 1892.



Augusta A., Chicago.	20	Adenoma of left breast as large as a walnut.	Noticed 4 weeks ago.	Enucleation; closure of wound with catgut sutures.	Primary union; one dressing.	Aug. 25, 1891. Returned for dressing Sept. 4.
Mrs. F. Sp., Chicago.	29	Fibro adenoma of left breast as large as a small hand.	6 years.	Removal of breast; closure of wound with silk suture; rubber drain.	Primary union; two dressings.	Feb. 16, 1892.
Miss M. E. L., Aurora, Ill.	40	Carcinoma of right breast.	3 years.	Removal of entire breast together with axillary glands and fat on fascia of pectoralis major muscle.	Primary union. This patient developed typhoid fever after two weeks, from which she recovered. The wound remained normal.	April 19, 1891. May 28, 1892.
Mrs. E. A. N., Hennepin, Ill.	62	Carcinoma of right breast; the tumor being adherent to pectoralis major. m.	8 mos.	Operation the same as in previous case. Removal of a portion of pectoralis major muscle; axilla packed with gauze, which was removed on fifth day.	Primary union.	May 3, 1891. May 24, 1891.
Mrs. C. S., Altona, Ill.	56	Carcinoma of right breast, involving axillary glands.	7 mos.	Operation the same as above without the removal of a part of the muscle.	Primary union.	Sept. 22, 1891. Oct. 16, 1891.
Mrs. A. S. H., Evanston, Ill.	56	Carcinoma right breast, involving axillary glands; ulcerated since eight months.	2 years.	Operation the same as above, but the amount of skin removed was much greater.	Wound healed primarily except where tension sutures cut; at these points it healed by granulation, remaining aseptic throughout.	Oct. 5, 1891. Oct. 27, 1891.
Mrs. W. E. H., Woodstock, Ill.	44	Carcinoma right breast.	1 year.	Same operation.	Primary union.	Nov. 3, 1891. Nov. 22, 1891.
Geo. J., South Bend, Ind.	6	Right inguinal hernia.	2 years.	Bassini's operation for radical cure, colloidion dressing.	Two dressings; primary union; opening closed firmly.	Nov. 17, 1891. Dec. 16, 1891.
Andrew L., Rockford, Ill.	50	Right inguinal hernia.	3 years.	The same operation.	Primary union; one dressing.	Jan. 28, 1892. Feb. 20, 1892.

Name and residence.	Age.	Diagnosis.	Duration of disease.	Treatment.	Result.	Date of admission.	Date of discharge.
Mrs. M. A. B., Chicago.	30	Right femoral hernia.	5 years.	Incision into sac; omentum adherent to sac and femoral ring. Loosening of omentum and resection of large piece. Closure of wound with four rows of catgut sutures.	Primary union; one dressing.	Mar. 20, 1892.	April 7, 1892.
Carl L. P., Cable, Ill.	69	Tuberculosis of knee. Patient's general condition much reduced from long continued severe pain.	2 years.	Amputation of thigh at lower third long anterior; short posterior flap; catgut sutures; no drainage.	Primary union; two dressings.	Aug. 17, 1891.	Sept. 15, 1891.
Abner M., Chicago.	77	Chronic inflammation of tendons of left hand, ankylosis of wrist and all of the joints of hand and fingers. A sinus extends through center of hand. Constant severe pain; has undergone several operations.	2 years.	Amputation at lower third; modified circular flap; no drainage; catgut sutures.	Primary union; two dressings.	March 4, 1892.	Mar. 13, 1892.
Peter E., Monmouth, Ill.	43	Deformity after compound Pott's fracture of left leg; faulty union; marked deformity; patient has not been able to walk.	14 mos.	Curettling of ulcer; longitudinal incision over surface of inner malleolus; osteotomy excision of wedged piece of bone with one and a half inch base; closure of wound with catgut sutures; no drainage; application of plaster-of-paris cast.	Primary union throughout; leg and heel was covered with blisters at first dressing, possibly the result of vigorous scrubbing; position perfect.	Nov. 30, 1891.	Feb. 23, 1892.
Clem R. S., Chicago.	23	Faulty union of tibia and fibula at lower third after compound fracture. Patient feels pain at point of fracture and in hollow of foot.	2½ yrs.	Operation the same as above.	Primary union; perfect position; patient is to remain under observation for ten weeks.	April 7, 1892.	April 23, 1892.



Ida M., Galesburg, Ill.	20	Tubercular glands of the left side of neck, superficial and deep, extending from angle of jaw to clavicle.	3 years.	Free incision; removal of glands; irrigation with iodine water; packing with iodoform gauze; secondary sutures; removed packing on fifth day and tied sutures.	Wound healed throughout without suppuration.	July 21, 1891.	Aug. 5, 1891.
Mrs. J. L., Chicago.	30	Tuberculosis of superficial and deep cervical glands left side.	6 mos.	Removal of all glands through a large incision from angle of jaw to clavicle, including lower half of parotid gland; iodoform gauze packing, etc., as above.	Wound healed throughout without suppuration.	March 8, 1892.	April 7, 1892.
Hedwig E., Ravenswood, Ill.	15	Tuberculosis of deep cervical lymphatic glands, increasing rapidly in size and number of late.	7 years.	Extirpation of gland; irrigation with iodine water; closure of wound with catgut sutures throughout.	Wound healed primarily throughout.	Mar. 13, 1892.	Mar. 27, 1892.
Miss Nettie C., Racine, Wis.	26	Chronic pelvic peritonitis; repeated pelvic abscesses; patient confined to bed for months.	1 year.	Abdominal section; found intestines adherent to each other, to pelvic organs, and to abdominal wall; loosened adhesions; freely drained cavity with glass drain, which I removed on fourth day; opened intestine at point of adhesion; closed with two rows of sutures.	Normal recovery; patient has gained twenty pounds since and is perfectly well.	April 10, 1892.	May 21, 1892.
Mrs. Mathilda B., De Kalb, Ill.	38	Chronic inflammation of the left ovary; patient has been treated repeatedly in several hospitals but without benefit; has been confined to bed for two years.	5 years.	Ovariectomy and breaking up of old adhesions.	Primary union normal throughout.	June 27, 1891.	July 21, 1891.
Mrs. S. J., Lake View.	37	Chronic inflammation of ovaries. Has been in another hospital twice for several months, each time without benefit. Confined to bed for more than one year.	7 years.	Ovariectomy same as above.	Primary union.	Nov. 28, 1891.	Jan. 19, 1892.

Name and residence.	Age.	Diagnosis.	Duration of disease.	Treatment.	Result.	Date of admission.	Date of discharge.
Miss Bertha H., Chicago.	16	Papillomatous ovarian cyst weighing thirty pounds adherent to mesocolon, to abdominal wall, floor of pelvis and omentum.	2 years.	Removal; Miculiez's drainage; packing removed in three portions on fifth, seventh, and ninth day.	Primary union except at point of drainage; normal throughout.	Feb. 6, 1892.	March 5, 1892.
Mrs. Louise S., Watertown, Wis.	59	Tubercular peritonitis, originating in left ovary or tube; abdomen contained thirty pints of fluid.	7 mos.	Abdominal section, removal of fluid; removal of left ovary and tube; large glass drain left in position for two weeks.	Primary union except at point of drainage tube.	Aug. 22, 1891.	Sept. 15, 1891.
Helen M., Geneva, Ill.	16	Tubercular peritonitis; twenty-five pints of yellowish fluid.	1 year.	Abdominal section, emptying cavity completely; large glass drain.	The same as above.	May 22, 1891.	July 2, 1891.
Ida N., Chicago.	16	Tubercular peritonitis; twenty pints of fluid.	2 years.	Operation the same as above.	The same as above.	April 5, 1892.	April 23, 1892.
Mrs. Anna R., Chicago.	43	Uterine fibroid as large as a child's head in the posterior portion of the body of the uterus, and another of equal size attached to the former by a finger-like pedicle; suffers severely from pressure caused by the very movable fibroid	2 years.	Ligation of broad ligaments on both sides; ligation of uterine arteries; application of rubber ligature around cervix; removal of portion one inch above ligature; cauterization of cervical canal with Paquelin cautery; closure of abdominal wound with silk sutures.	Primary union; dressed on ninth day to remove the stitches and rubber ligature; dressed wound once a week until discharged.	Mar. 21, 1892.	April 25, 1892.
Mrs. Louise W., Chicago.	53	Sarcoma of right kidney as large as a child's head.* *This case was reported in detail to the Chicago Medical Society, November 2, 1891.	14 mos.	Nephrectomy by abdominal section.	Normal recovery; primary union except at point of drainage.	Aug. 22, 1891.	Sept. 23, 1891.



Mrs. John P., Altoona, Ill.	39	Patient has two slightly irregular, hard abdominal tumors, slightly movable. The urine contains a trace of albumen; menstruation has been irregular for ten months.	10 mos.	Exploratory abdominal section, demonstrating the presence of multilocular cysts of both kidneys; closure of wound with deep sutures.	Normal recovery; primary union.	Oct. 17, 1891.	Nov. 6, 1891.
Miss Josephine S., De Kalb, Ill.	17	During the past two and one half years patient has had five attacks of peritonitis originating in the right iliac region, with characteristic symptoms of acute appendicitis. The last attack, three months ago, was especially severe, and leaving a distinct point of hardness and tenderness in this region.	2½ yrs.	Longitudinal incision over cecum; loosening of numerous adhesions between omentum and cecum and ilium; ligation of mesentery of appendix and ligation of appendix with silk; cauterization of its lumen with strong carbolic acid. The lumen of the appendix was found occluded half an inch from its origin; closure of entire wound.	Normal recovery; primary union.	Jan. 6, 1892.	Jan. 27, 1892.
George E., La Valle, Wis.	33	Over two years ago I removed six inches of patient's rectum by means of resection of sacrum and coccyx (Kraske's operation); having a recurrence of the tumor in the sigmoid, which I removed with the Paquelin cautery two weeks ago. A stricture is to be expected.	4 years.	Maydl's inguinal colostomy; incision parallel with the fibres of the external oblique muscle of the abdomen three inches long in the left inguinal region; separation of fibres of external oblique and also of internal oblique; incision through transversalis fascia and peritoneum; attachment of peritoneum to skin; sigmoid flexure brought up into the wound; a glass rod covered with iodoform gauze passed through mesocolon and permitted to project beyond wound of abdominal wall. Transverse incision through colon on third day, leaving posterior wall.	Patient suffered from pain until the intestine was opened; the temperature never exceeded 100° F.	May 28, 1891.	June 13, 1891.

Name and residence.	Age.	Diagnosis.	Duration of disease.	Treatment.	Result.	Date of admission.	Date of discharge.
Mrs. C. G. A., Galesburg, Ill.	47	Aneurism of right vertebral artery as large as an orange, caused by a blow from a baseball.	4 years.	Removal through a longitudinal incision; controlled hemorrhage with long-jawed forceps and tamponing; closed remainder of wound with deep silk sutures.	Primary union except at point of forceps; there secondary union; removed forceps after forty-eight hours.	Feb. 17, 1892.	Mar. 22, 1892.
Mr. W. A. F., Whitewater, Wis.	23	Loosened fractured semilunar cartilage of right knee after injury.	2 years.	Longitudinal incision over external condyle; removal of cartilage; closure of wound with three rows of catgut sutures; plaster-of-paris cast.	Primary union; one dressing.	Mar. 2, 1892.	April 17, 1892.
John S., Chicago.	43	Varicose ulcer of right leg; internal surface.	7 years.	Excision of three inches of the internal saphenous vein; kept limb elevated for four weeks.	Primary union; two dressings.	Jan. 6, 1892.	Feb. 2, 1892.
Oscar J., De Kalb, Ill.	11	Tuberculosis of hip-joint; destruction of neck of femur; had been treated for eight months with extension and immobilization without benefit.	8 mos.	Resection of hip; packing of cavity with iodoform gauze; applied secondary sutures; one week later removed packing; iodoformized the cavity and packed it with decaolified bone chips and tied secondary sutures and applied plaster cast; changed dressing again after four weeks. Later, Buck's extension was applied.	Wound united with exception of a small superficial point; extension to be continued for one year at night; no sup-puration.	Sep. 15, 1891.	Jan. 29, 1892.



This table contains abstracts of the histories of forty-seven consecutive operations for non-suppurative conditions upon nearly every portion of the body, and varying in severity from a simple incision to operations of the gravest character.

These operations having been performed in the same hospital and with the same precautions, their number is sufficient, I think, to establish the efficacy of the method.

Of course I have operated during this time upon many cases suffering from conditions complicated with suppuration before the operation, with equally good results, but this paper is already too long, and a further addition of histories would simply increase this fault, so I will reserve these for a future paper.

For the sake of convenience I have arranged these histories in groups of similar cases. The first group comprises seven operations of various characters upon the face, all of which recovered rapidly, and without suppuration. The second group contains operations upon the scrotum. In three cases excision of enlarged veins in varicocele was made; in the fourth case I treated a tubercular hydrocele by open incision, packing the cavity with iodoform gauze. The cavity became infected two weeks after the operation. There had been severe itching, which the patient had tried to relieve by inserting his finger beneath the dressing and scratching the skin. This is the only case in this entire list which became infected, and here it is quite apparent that the cause of infection was in no way connected with the operation.

The third group comprises six non-malignant tumors, most of them being of a considerable size. All of these wounds healed primarily, four of them with one and two with two dressings; in the latter the first dressing was made to remove the drainage and the second to remove the sutures. These patients were in the hospital ten days on an average.

The fourth group contains five cases of cancer of the breast. In each case the entire breast, together with the fascia of the pectoralis major and the fat and lymphatic glands of the axilla, were removed. All wounds healed primarily except the fourth, in which the tumor had ulcerated, necessitating the removal of a very large amount of skin. In this case the tension sutures destroyed a small amount of skin, which healed by granulation.

Case one was peculiar in that she developed typhoid fever two weeks after the operation. The wound was entirely healed, and was not influenced by the typhoid fever. The patient recovered normally. These patients remained in the hospital about three weeks each.

The fifth group consists of three herniotomies, each one of which healed primarily. The patients remained in the hospital four, three,

and two and one-half weeks respectively. The first case, a boy of six years, was kept longer than the other cases, because I desired to prevent an accident to the scar, with possible recurrence, through some imprudence of the child.

The sixth group contains two amputations; one of the thigh, and one of the forearm, both without drainage, and both healing primarily. The first case was in the hospital four weeks, being kept two weeks after his stump had healed, in order to build up his general condition, which was much reduced at the time of the operation; the second case was in the hospital nine days.

The seventh group consists of two cuneiform osteotomies of the tibia for faulty union of compound fractures of the leg, which healed primarily.

The eighth group has three cases in which I removed superficial and deep tubercular glands of the neck, extending from the angle of the jaw to the clavicle. The wounds were treated by the use of iodoform gauze packing and secondary sutures; the packing was removed and the sutures tied on the fifth day. These cases healed without the occurrence of pus, in from two to four weeks.

The ninth group comprises twelve abdominal sections. All of these cases recovered, and in each one the abdominal wound, varying from three to twelve inches in length, healed primarily.

These sections were performed for the following conditions: In CASE I. the intestines and the pelvic organs were adherent to each other and to the abdominal walls, causing severe pain, so that the patient had to be confined to bed for months. These adhesions were loosened, a glass drainage tube was introduced and left in place for four days. The next two cases were simple ovariectomies for the relief of pain due to pressure upon the ovaries by old adhesions. CASE IV., a papillomatous ovarian cyst weighing thirty pounds and adherent to the abdominal wall, to the floor of the pelvis, to the mesocolon, and the omentum, in a girl sixteen years of age, required an incision extending from the ensiform appendix of the sternum to the symphysis pubis. The wound healed primarily throughout except at the point of drainage, the patient's temperature remaining below 100° F., the same as in the simple ovariectomies.

CASES V., VI. and VII. were operated for the relief of an enormous distension of the abdomen with fluid caused by the presence of tuberculosis of the peritoneum, originating apparently in each case in the left fallopian tube. Each one of these cases recovered without a sign of pus infection.

CASE VIII. A fibromyoma of the posterior uterine wall and a pediculated fibroid from the fundus, each as large as a child's head,



was treated by the use of an external pedicle. The patient recovered without a sign of shock or temperature, and without suppuration, requiring only four dressings.

CASE IX. A sarcoma of the kidney as large as a child's head was treated by means of nephrectomy through an abdominal incision. Here again there was primary union except at the point of the drainage-tubes. In case X. an exploratory laparotomy showed the presence of double multilocular cyst of the kidneys; the wound healed primarily, the patient leaving the hospital twenty days after her admission.

CASE XI. in which I removed the vermiform appendix because the patient's life had been in danger several times from recurrent severe attacks of appendicitis, recovered with primary union of the wound throughout, leaving the hospital three weeks from the time of admission.

CASE XII. An inguinal colostomy according to Maydl's method left the hospital two weeks after the operation, having been normal throughout.

In the tenth group we have the remaining four miscellaneous cases. 1. Enucleation of an aneurism of the right vertebral artery as large as an orange; 2. removal of a fractured semilunar cartilage; 3. excision of three inches of the internal saphenous vein for the relief of a varicose ulcer. Each of these three cases healed without suppuration.

The fourth case, a resection of the hip, was treated by means of what appears to me to be a novel method. A typical resection was made through the neck of the femur. The tubercular synovial membrane was carefully dissected out; every particle of suspicious tissue was removed. The cavity was then irrigated with a solution of tr. of iodine in water the color of sherry, then dried and thoroughly rubbed with iodoform, then packed with iodoform gauze and secondary sutures applied. One week later the packing was removed; the cavity once more dusted with iodoform and filled with Senn's decalcified bone chips thoroughly rubbed with iodoform. Over these the secondary sutures of silk-worm-gut were tied and a plaster-of-paris cast applied over the usual dressing. The wound remained aseptic, the dressing was changed and the stitches removed after three weeks. The wound had healed throughout, except at the point of the stitches. There was no pus. After this extension was applied for orthopaedic purposes, giving the patient but slight shortening and a very good position for the limb.

A study of these abstracts, in which I wish to direct your attention particularly to the short time each patient was confined to the hospital, will speak for the value of the method employed.

It is extremely simple. It does not annoy the patient or the surgeon unnecessarily. It is inexpensive and requires only such things as any one can readily procure.

To secure an aseptic condition of the wound after any operation for a non-suppurative condition, it is but necessary to have soap and boiled water, a scrubbing-brush, a pint of strong alcohol, a pound of clean absorbent cotton, a can of commercial sterilized or antiseptic gauze and a number of freshly laundried towels.

Of course I do not attribute the rapid and satisfactory recovery of these patients entirely to the methods employed. Much of this is due to the excellent care the patients received from the able and enthusiastic nurses of this hospital

LITERATURE. I had collected a list of articles bearing upon this subject, when the valuable book on aseptic surgery by Schimmelbusch (*Aseptische Wundbehandlung* Schimmelbusch, August Hirschwald, Berlin) appeared containing a much more complete list, so I will refer those interested to that work.

710 SEDGWICK STREET.











